IN THE FIELD

Field Museum
Member Magazine

Vol. 92, No. 1
Winter 2021

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ON THE COVER
Jane Goodall, 35 years after her original observations, finding great joy in watching the Gombe chimpanzees. Gombe National Park, Tanzania.

MICHAEL NICHOLS, NATIONAL GEOGRAPHIC

Let us know your thoughts about *In The Field* magazine. Email your comments to ITF@fieldmuseum.org

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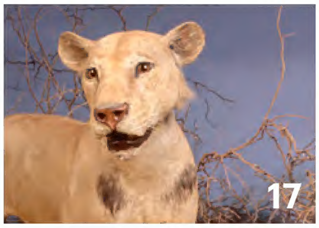

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Dear Friends,

FIELD MUSEUM

2021 brings renewed hope and energy to the Museum. We all know too well the challenges of 2020—and yet, as you'll see from our Year in Review (p. 3), the Field Museum upheld and continued our mission, thanks to your steadfast support.

Now, we look forward to sharing even more with you online and in person. We are delighted to be open once more, inviting our members and visitors back into the galleries to explore safely. Our galleries haven't been the same without you, and there are new details to discover, like the megalodon jaw installed last month in Stanley Field Hall.

In May, we'll open our first new exhibition in more than a year. *Becoming Jane: The Evolution of Dr. Jane Goodall* (read more on p. 8) reminds us what is possible through curiosity, empathy, and dedication to the natural world.

If you haven't yet had a chance to see *Apsáalooke: Women and Warriors* and are able to come to the Museum, I hope that you will do so—it is a powerful and moving exhibition at any time but especially now during Women's History Month.

2021 also marks the centennial of our Museum's home here in Grant Park (p. 14). This will be a year of celebrations, and I look forward to sharing them with you.

Warm regards,

Julian Siggers

Julian Siggers, PhD

President and CEO

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As of February 2021

(Left) For the first time, the Field Museum partnered with the Bud Billiken Parade, a back-to-school tradition honoring African American heritage on Chicago's South Side. The Field joined this year's virtual celebration by inviting youth and schools to get involved in the museum's many education programs, like the Green Ambassadors.

(Top) On an unSUEpervised stroll through the Museum, our famous T. rex *looks for a midnight snack in the mammals collection.*

(Above) Chicago Public School teachers receive ready-made learning packets from the Field's museum Learning Center.

2020 in Review

It's hard to describe last year in just a few words, as a year that brought struggles to so many. At the Field, we're taking a moment to reflect on successes big and small, and to recognize the people who inspire us: you, our donors and members; staff; dedicated partners around the world; and our neighbors in the Chicago community.

Though our building was closed to the public for several months, work continued behind the scenes and in the community. Our conservation lab used its 3D printers to make face shields for organizations in Chicago and the Navajo Nation. Staff in the Learning Center created new resources for learning at home. And, SUE roamed the Museum unsupervised!

As a Field Museum member, your continued support made all of this possible. Thank you!

14,000

interactions with online Learning Resources

1,500

science packets delivered to Chicago schools

5,764

native plants distributed to schools and community gardens

225

new papers published by Field Museum scientists

2021 SCIENCE INNOVATION AWARD: CORONAVIRUS

BY ADAM FERGUSON, PHD, NEGAUNEE COLLECTIONS MANAGER, GANTZ FAMILY COLLECTIONS CENTER

Where did SARS-CoV-2020 come from? Was the wild host for this zoonotic pathogen a bat, pangolin, or some other mammal? These and other questions are on the forefront of many people's minds these days. What might not be on folks minds, however, is that natural history museums and their millions of specimens can help answer questions related to the emergence and mitigation of such viruses. Thus, I was thrilled to learn that my colleagues—including, among others, MacArthur Curator of Mammals Bruce Patterson, Negaunee Curator of Mammals Larry Heaney, and Field Biologist Steve Goodman—and I were awarded the 2021 Science Award to do just that.

The Science Innovation Award is made possible by a generous endowment from an anonymous donor. It's granted on a competitive basis each year by the Field Museum Science and Scholarship Funding Committee. Our project titled "Of models and specimens: Testing predictions of betacoronavirus hosts with the Field Museum's mammal tissue collection" aims to test the effectiveness of predictive models based on known host-virus associations at predicting other likely hosts that have yet to be discovered.

Betacoronavirus represents one of four genera of coronaviruses—positive-strand RNA viruses that infect mammals, including humans. This genus includes such famous human-disease causing viruses as SARS-CoV-2, MERS-CoV (Middle East Respiratory Syndrome-Coronavirus) and the original SARS (Severe Acute Respiratory Syndrome) SARS-CoV-1, a virus that spilled over from Southeast Asian wild mammals, like horseshoe bats (*Rhinolophus sp.*), into humans in 2003. Our strategy is to merge predictive modeling techniques with preserved tissue samples collected by Field scientists to test for diversity in betacoronaviruses across a broad range of mammalian hosts.

Using cutting-edge DNA/RNA sequencing methodologies, we plan to screen a subset of species selected from the more than 10,000 flash-frozen tissue samples housed at the Museum for SARS-CoV-2 related viruses. Positive samples will be sequenced to generate complete genomes of betacoronaviruses for evolutionary studies. Through this grant and additional support provided through an Institute of International Education Rodman Rockefeller Centennial Fellowship to project partner Dr. Molly McDonough (Chicago State University and Field Museum), we will be able to support four Chicago State University students as project participants, expanding analytical training opportunities for underrepresented groups.

(Right) Over 1,400 species of bats have been documented world-wide, and more are discovered each year. This species is Cynopterus brachyotis, a dog-faced fruit bat, which occurs widely in Southeast Asia, including southern China, often in heavily populated agricultural areas.

(Above) A rack of flash-frozen tissue samples is pulled from one of six liquid nitrogen storage dewars in the Field Museum's cryo storage facility. This facility houses nearly 300,000 tissue samples at -180 degrees Celsius/-292 degrees Farenheit.

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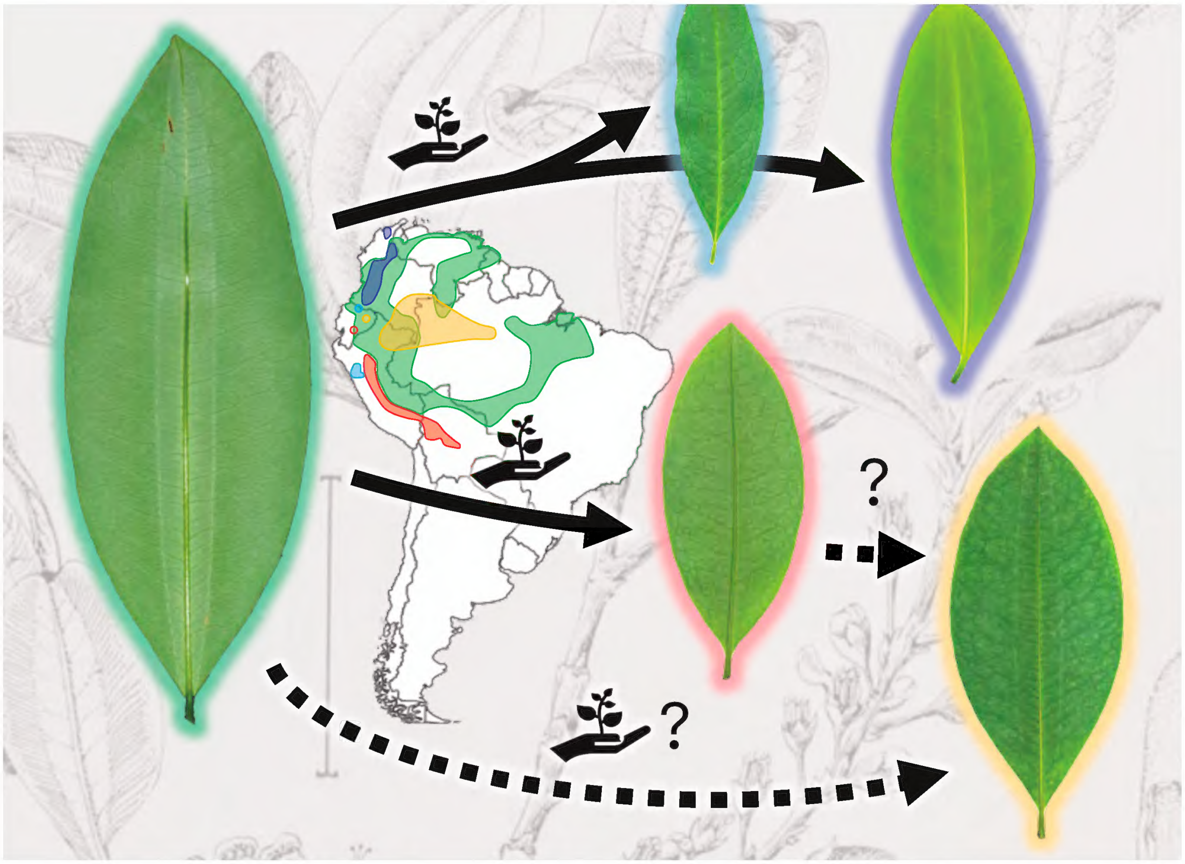
New at the *Grainger Science Hub*

What can our collection teach us about pandemics? Diseases like COVID-19 are caused by viruses that originate in animal species and "jump" to humans. Explore the Field's Coronavirus research first-hand through a new display in the *Grainger Science Hub*. Get a front-row seat to science as it happens and explore what we've discovered so far.

Explore safely

The *Grainger Science Hub* is open from 11am–3pm, Thursday–Monday. For the safety of our guests and staff there is a capacity limit of 10 people in the space at a time, but no ticket is required. Like the rest of the Museum, masks are required to enter and cleaning is frequent.



(Left) Genetic analyses now reveal two distinct domestication events from wild progenitor E. gracilipes (green) produced Bolivian coca (red) and the ancestor of Colombian (purple)/ Trujillo (light blue) cocas, and possibly a third produced Amazonian coca (yellow). Distributions of cultivation are shown on the map of South America.

(Below) Aymara women in Coroico, Bolivia harvest their coca fields.

DAWSON WHITE

DOMESTICATION OF A CONTROVERSIAL PLANT

BY DAWSON WHITE, PHD, POSTDOCTORAL RESEARCH SCIENTIST, NEGAUNEE INTEGRATIVE RESEARCH CENTER

As a plant systematist, I use DNA to build and analyze the tree of life in order to better understand plant diversity and the forces that have generated it. My primary focus is the coca plant (as in Coca-Cola, not coconut or chocolate trees), an ancient shrub reverently consumed in South America for over 8,000 years as a medicine and mild stimulant. It also synthesizes a potent insecticide in its leaves called cocaine.

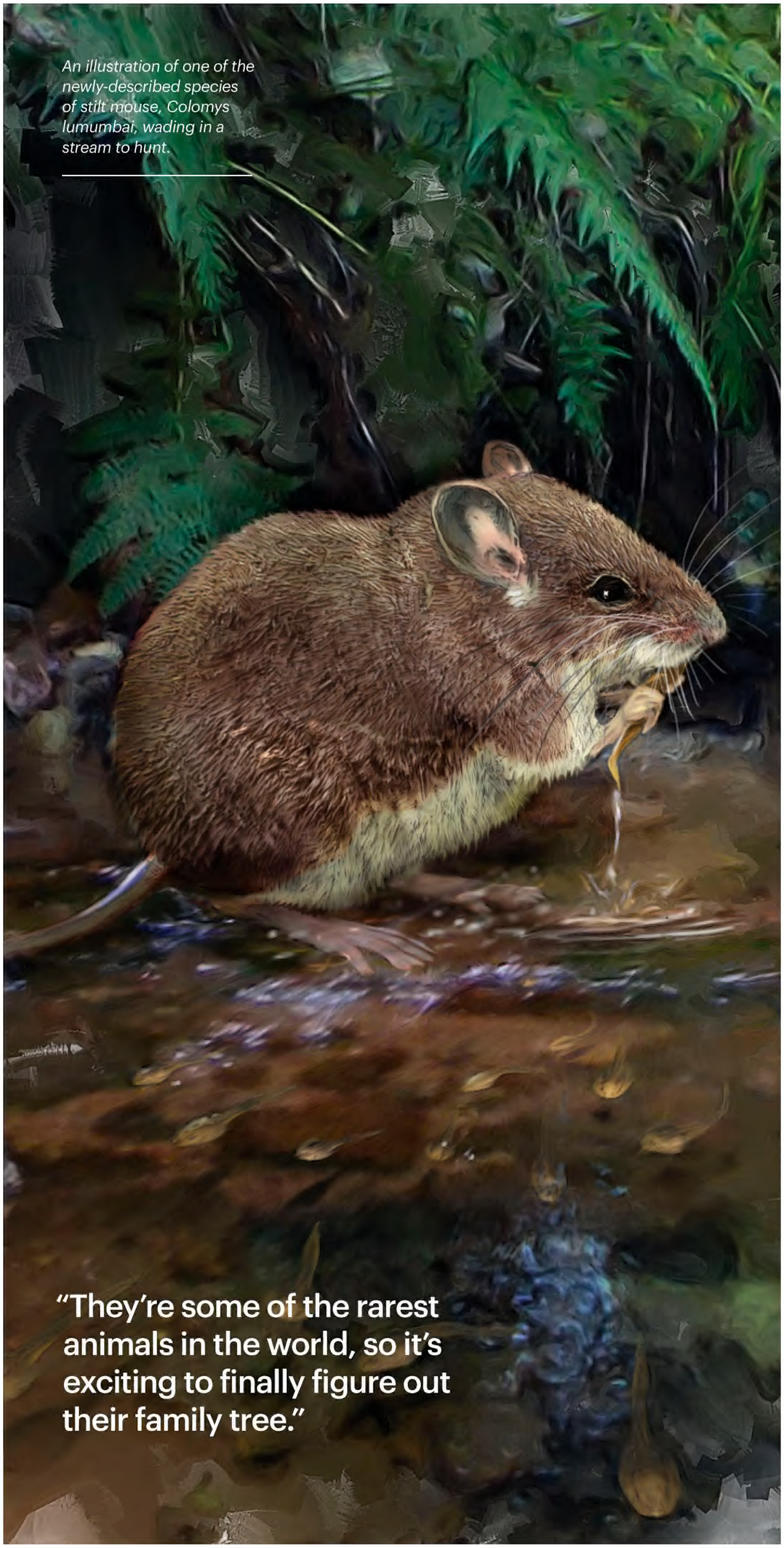
In the 1970s, Field Museum curator, Tim Plowman, PhD, was the first to investigate the different forms of coca crops across tropical South America. This resulted in the taxonomic description of four different varieties of coca (Amazonian, Bolivian, Colombian, and Trujillo) which he thought were all developed after a single domestication event of a wild form of coca. But, there's one problem: coca doesn't grow in the wild.

So, were these crops actually transformed from a wild *Erythroxylum* species by ancient Native Americans? Are the four varieties parts of one single crop derived from one domestication event, or do the varieties represent multiple distinct yet similar crops from multiple independent domestications?

To narrow down the closest wild relatives of the crops, I analyzed the DNA of over 200 wild *Erythroxylum* species from our collections. After identifying the wild cousins and studying their genetic patterns, the genomes painted a new picture of the evolutionary history of distinct crops. Colombian and Trujillo coca are two forms of one crop lineage resulting from the domestication of wild *Erythroxylum gracilipes* over 8,000 years ago in Colombia and Ecuador. More recently, Bolivian coca was independently domesticated from *Erythroxylum gracilipes*, most likely in Southeastern Peru! Amazonian coca could be from yet another independent domestication of *Erythroxylum gracilipes*, or possibly derived from Bolivian coca.

CAROLINE CONZELMAN

With this blueprint of diversification, we now know that "coca" is two or three separate crops created when distinct South American peoples independently transformed the same natural resource into a helpful and dependable product. The specimens in the Field's John G. Searle Herbarium have revealed a complex history that has reshaped the fundamental identity of a very special crop plant.



An illustration of one of the newly-described species of stilt mouse, Colomys lumumbai, wading in a stream to hunt.

"They're some of the rarest animals in the world, so it's exciting to finally figure out their family tree."

VELIZAR SIMEONOVSKI

DISCOVERING THE ELUSIVE AQUATIC MOUSE

BY KATE GOLEMBIEWSKI, PUBLIC RELATIONS

Scientists have a pretty good handle on the big mammals out there—like lions, tigers, and bears. But there's a whole world of small mammals that are still unknown to science. Field Museum researchers just described two: aquatic mice that wade in tropical African streams and hunt bugs with their whiskers.

"These mice are long-footed, kind of like a kangaroo. They sit up on their haunches and wade through shallow streams with their whiskers on the water's surface to detect movements—like sonar," said Julian Kerbis Peterhans, PhD, an adjunct curator at the Field Museum who helped describe the two new species, along with Field postdoctoral researcher Terry Demos, PhD, and Siena University's Tom Giarla, PhD.

The new species are related to another mysterious rodent—a different aquatic mouse genus, known by just one specimen collected on a Field Museum expedition 93 years ago in Ethiopia. That specimen is currently in the Field's collections, so the researchers were able to take a tiny piece of dried tissue and analyze its DNA. They learned that the 93-year-old specimen is one of the closest relatives of the new species.

"These two groups of mice have been confused with one another for a century," said Kerbis Peterhans. "They're some of the rarest animals in the world, so it's exciting to finally figure out their family tree."

Learning about the different species of mice in streams halfway around the world has broad implications for conservation science. "The new species we named are part of a global effort to understand the biodiversity of African rainforests and highlight the critical areas to be preserved," said Demos.

VANNE GOODALL, NATIONAL GEOGRAPHIC

(Opposite) Jane Goodall and National Geographic photographer Hugo van Lawick observe a family of chimpanzees.

(Right) Jane Goodall, in her home in Dar es Salaam, Tanzania. 1995. Jane wrote 20-30 letters a day trying to further her goals of protecting chimpanzees, their rights and habitat.

Becoming Jane: The Evolution of Dr. Jane Goodall is a new exhibition that charts Dr. Goodall's journey from curious young child to world-renowned scientist. This award-winning exhibition features stunning photography—provided by National Geographic and the Jane Goodall Institute—documenting her early experiences in the field.

BECOMING JANE

By Emily Parr

EXHIBITIONS

MICHAEL NICHOLS, NATIONAL GEOGRAPHIC

Created in partnership with the Jane Goodall Institute, *Becoming Jane* includes personal memories and stories from Dr. Goodall herself. Contributions to the exhibition include her childhood books, well-loved toy chimpanzee, as well as field journals and equipment. These allow visitors the chance to get to know Goodall in a charming, personal way.

Visitors will walk along her journey and experience her evolution from inquisitive child in Bournemouth, England, to scientist and global activist. They will explore a replication of Goodall's field tent and take in a panoramic film.

Goodall recalls: "Life in Gombe had its own rhythm. I awoke before dawn each morning, took a cup of coffee and a bit of bread, and set out to look for the chimpanzees. After observing all day, I'd return to camp at dusk and, by the light of a hurricane lamp, write in my journal."

Life in the forest was tough and the work was often disappointing, but her perseverance paid off. Goodall's approach to studying the chimpanzees—understanding them as individuals with unique personalities and relationships—was revolutionary. Through her patient observations she discovered a lot about them, including the stunning revelation that chimpanzees make and use tools. While this may not sound surprising to us today, at the time scientists believed that making tools was something only humans could do. Goodall's research fundamentally changed how scientists understand chimpanzees and ultimately how we understand ourselves.

Today, Goodall has taken her work beyond the wild and spends her time as a conservationist and activist. Her message of hope will inspire visitors to do their part to help protect the natural world. She says: "It is up to us—you and me—all of us...Together, we can and will change the world."

Learn more about Dr. Jane Goodall's life and work in *Becoming Jane: The Evolution of Dr. Jane Goodall,* which opens at the Field Museum for a limited time from May 21, 2021 to September 6, 2021.

Member Preview dates: May 17 and 20, 10am-4pm

Watch for registration information in our weekly e-news closer to the dates.

An exhibition organized and traveled by the National Geographic Society in partnership with the Jane Goodall Institute.

NATIONAL GEOGRAPHIC | the Jane Goodall Institute

"FIREBALL" METEORITE CONTAINS PRISTINE ORGANIC COMPOUNDS

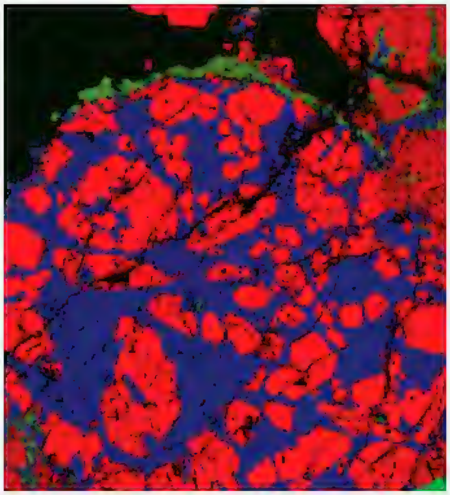
BY PHILIPP HECK, PHD, ROBERT A. PRITZKER CURATOR FOR METEORITICS AND POLAR STUDIES, NEGAUNEE INTEGRATIVE RESEARCH CENTER; AND **JENNIKA GREER,** UNIVERSITY OF CHICAGO AND FIELD MUSEUM RESIDENT PHD STUDENT

The Hamburg meteorite landed near the Michigan town of that name on January 16, 2018, and the first piece made its way to the Field Museum's Robert A. Pritzker Center for Meteoritics and Polar Studies within 48 hours—thanks to the fast work of meteorite hunter Robert Ward and the generosity of The Boudreaux Family. The meteorite was recovered quickly with the help of a map of the strewnfield generated with weather radar data.

Because the multiple fragments landed on frozen lakes, they were not exposed to liquid water and, because they were recovered quickly, they experienced little to no weathering or contamination from Earth's environment. This is what makes this particular meteorite special compared to many others. Many meteorites that fall to Earth become contaminated with compounds and elements from Earth's surface, making them more difficult to study accurately.

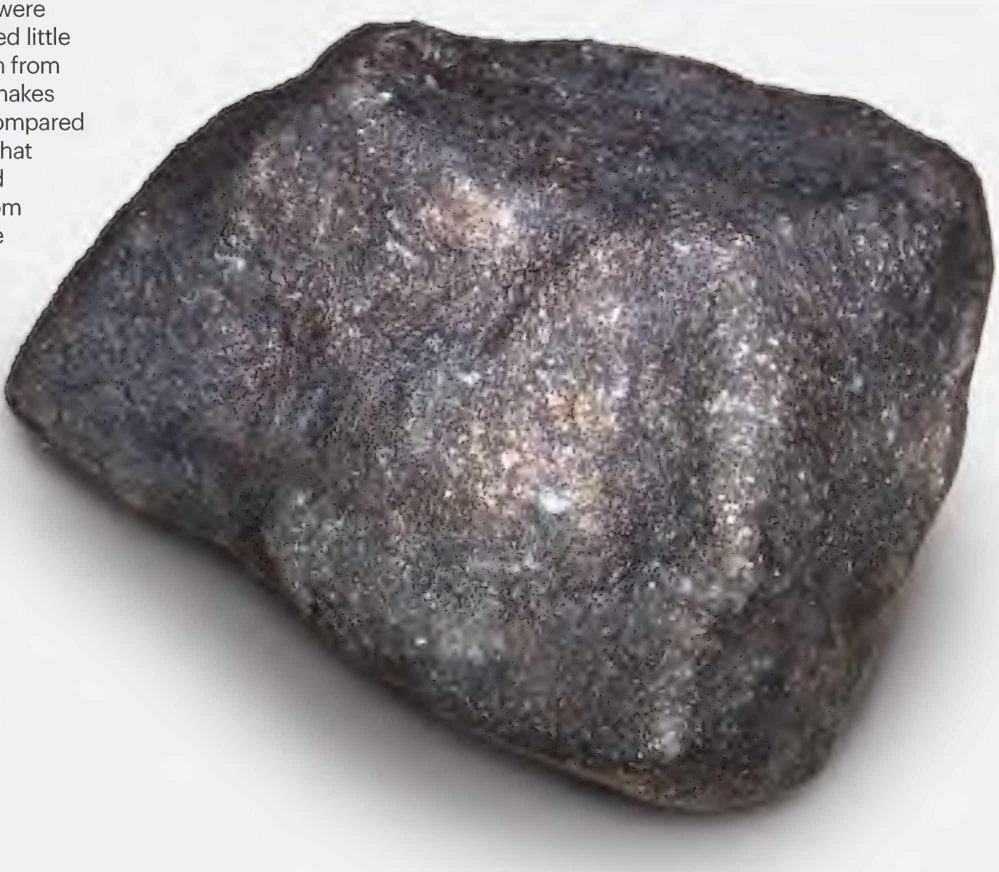
Upon arrival at the Museum, we classified the Hamburg meteorite within the week and began to reach out to colleagues who were interested in working with us to reveal its secrets. We ended up working with an international consortium of 29 scientists at 24 institutions. Through analysis of radioactive uranium and lead isotopes, our team found that the Hamburg formed around 4.5 billion years ago. Shortly after it formed, the asteroid was still hot and caused slight changes in the rock texture and composition. Even with this alteration, our team found 2,600 different organic compounds, with some of them formed during thermal metamorphism.

The rich diversity of organics in the Hamburg and other meteorites provides support for the hypothesis that an influx of organic matter from space to early life-less Earth may have provided some of the building blocks for life. Analyses of the noble gas argon revealed that it has been quiet on the Hamburg parent asteroid for a very long time—for 4.5 billion years—and it was only 12 million years ago that a small asteroid hit the parent body and released the Hamburg into space onto an orbit that would eventually cross paths with Earth. Our study is currently the second most-read article in the journal *Meteoritics & Planetary Science*, and was covered by news media including CNN, The Guardian, and Gizmodo.



XXHECK, GREER ET AL. *METEORITICS & PLANETARY SCIENCE* 2020

ROBERT WARD



XXHECK, GREER ET AL. *METEORITICS & PLANETARY SCIENCE* 2020

(Top) Color-coded map of silicate-bearing chondrule in a cross-section of the Hamburg meteorite. The X-ray map shows magnesium in red, calcium in green, aluminum in blue, all useful for classification purposes. The most abundant elements silicon and oxygen are omitted.

(Above) Meteorite hunter Robert Ward on Lake Strawberry with the type specimen.

(Right) Micrograph of the complete type specimen.

Cassowaries look like living dinosaurs with thin, shiny feathers all over their body.

(Below) Microscopic detail of a cassowary feather, showing the exposed rachises that allow for iridescence.

CREATIVE COMMONS

WHY DO CASSOWARIES SHINE?

BY KATE GOLEMBIEWSKI, PUBLIC RELATIONS

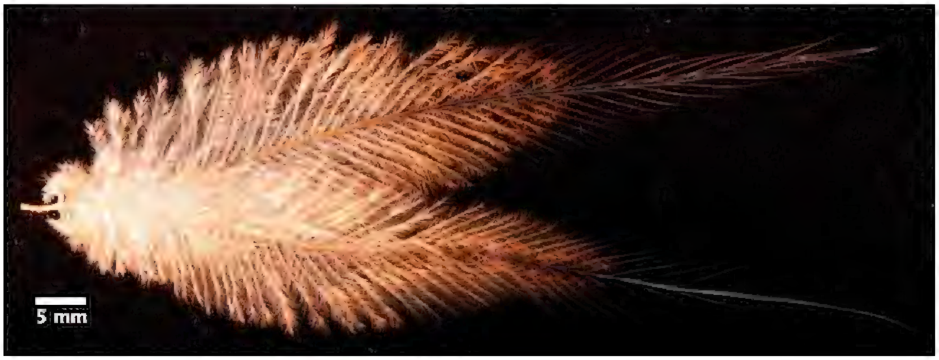
Cassowaries are large flightless birds with blue heads and dinosaur-looking feet—and they're objectively terrifying. They're also, along with their ostrich and kiwi cousins, part of the bird family that split off from chickens, ducks, and songbirds 100 million years ago. In songbirds and their relatives, scientists have found that the physical make-up of feathers produce iridescent colors, but they'd never seen that mechanism in the group that includes cassowaries—until now.

"A lot of times we overlook these weird flightless birds. When we're thinking about what early birds looked like, it's important to study both of these two sister lineages that branched from a common ancestor 80 million or so years ago," says Chad Eliason, PhD, a staff scientist at the Field Museum and the paper's first author.

In humans and other mammals, color mostly comes from pigments like melanin in our skin and hair. But in birds, some of their colors are created by physical structures in their feathers called melanosomes. Different shapes or arrays of melanosomes as well as the layers of keratin making up a bird's feathers cause light to be refracted in ways that create different colors and shimmering effects.

A feather is structured like a tree. The long trunk running through the middle is called the rachis and it has branches called barbs, which are covered with tiny barbules. In other birds, glossiness is produced by the shape of the barbs and layers of melanosomes in barbules. But, Eliason and his colleagues didn't find these structures in cassowary feathers. Instead, they discovered that the shiny black color comes from the rachis, which is exposed to more light in cassowaries because of their sparse barbules.

The researchers aren't sure why birds evolved two different ways to build shiny feathers—why reinvent the wheel? Eliason suspects that cassowaries' flightlessness may be the cause. In flighted birds, the number one priority for feather structure is being aerodynamic. "Needing to be able to fly is a very strong stabilizing force on wing shape," says Eliason. "Losing that constraint, might result in new feather morphologies that produce gloss in a way that a flying bird might not."



CHAD ELIASON

HOW DO WE SAVE THE RAINFOREST?

BY NOÉ U. DE LA SANCHA, RESEARCH ASSOCIATE, NEGAUNEE INTEGRATIVE RESEARCH CENTER

“Save the rainforests” is a snappy slogan, but it doesn’t tell the full story of how complicated conservation is. Before we can begin restoring habitats and advocating for laws that protect land from poachers and loggers, scientists need to figure out what’s living, what’s dying, and which patterns explain why.

My recent study in *Biotropica* crunched numbers from a large dataset of small mammals of the South American Atlantic Forest and found something surprising in the process: climate may explain biodiversity patterns in rainforests at a biogeographical scale even more than deforestation.

The Atlantic Forest is the second most diverse forest system in South America after the Amazon. It stretches from northeastern Brazil south through Argentina and into eastern Paraguay. Less than one-third of the original forest system is left.

Our goal was to determine what variables best explain the patterns of biodiversity—including deforestation, climate, sampling efforts, and latitude. Although all dimensions of biodiversity are correlated with each other, they have unique information and should be considered individually when studying biodiversity and informing conservation strategies.

As a whole, we found each metric of biodiversity was best explained by different variables. Similarly, different taxonomic groups were most affected by different variables. Functional diversity was not geographically structured, which means that areas throughout the Atlantic Forest function the same, whether in northeastern Brazil or eastern Paraguay. This means that even if there are different species across habitats their ecological roles are similar.

> **Before we can begin restoring habitats and advocating for laws that protect land from poachers and loggers, scientists need to figure out what’s living, what’s dying, and which patterns explain why.**

Meanwhile, changes to the climate may have big, sweeping effects on the entire rainforest system. We found that six different temperature and precipitation variables best described various aspects of biodiversity in the whole ecosystem and differed by taxonomic groups. This study and others provide strong evidence of climate change’s effects on large ecosystems, underlining the urgency of studying and protecting habitats like the Atlantic Forest.

(Below, left) Soy farms outside of Limoy Biological Reserve, in Alto Paraná Department in eastern Paraguay.

(Below, right) In the Amazon and Atlantic forests, destruction of habitat and climate change have a huge impact on local communities.

BOTH IMAGES NOÉ U. DE LA SANCHA

ANDY ROCK

POKAGON POTAWATOMI BLACK ASH BASKETS: OUR STORYTELLERS

BY JOHN N. LOW, PHD, POKAGON BAND OF POTAWATOMI CO-CURATOR AND BASKET CARETAKER

In the last century, items of Native material culture have become items for non-Native collections, museums, and exhibitions—although they were often poorly labeled, identified, and understood. However, particularly since the 1990s, Native peoples have demanded a voice and authority in sharing the beauty, technology, and meaning of their art and artifacts. One of the powers in these objects includes the ability to facilitate conversations between peoples of different communities and backgrounds. The Field Museum has been an important example of the new way in which Natives and non-Natives collaborate on exhibitions about Indigenous cultures. This spring the Field will open *Pokagon Potawatomi Black Ash Baskets: Our Storytellers* to further strengthen the transition to shared storytelling.

The Pokagon Potawatomi peoples are familiar with the traditions of our ancestors and know the multiplicity of stories within baskets. The baskets—assumed silent, static, and lifeless—speak to many of us. *We* have ears that will listen. *We* know the origins. The baskets are imbued with the spirit of the material and maker. *We* hear the stories that the basket waits to tell. A thank you prayer, spoken softly, a song sung to the basket as busy hands work the ash. Hands that lay down tobacco, weave strips into another life; scrape ribbons of wood until they are as smooth as satin. *Listen* for the voices that sing children to sleep, comfort a partner, worry over an elder, and pray. The hands heard weaving are the same hands that make bread and plant seeds for food. Seeds of knowledge and wisdom are also planted with these busy hands. Stories emanate from the baskets. Like the songs, prayers, and plantings of our grandmothers, we hear those stories. Because we know to listen. We know the songs the baskets sing.

This exhibition celebrates these baskets and their makers. It tells a story of survival and resilience. But it also contains a cautionary tale and a warning of environmental catastrophe as the emerald ash borer, an invasive beetle from Asia, decimates black ash tree populations in North America. What will the Pokagon Potawatomi make their iconic baskets out of if all the black ash trees are gone? That is a question that concerns us all.

Pokagon Potawatomi Black Ash Baskets: Our Storytellers opens to the public April 16, 2021 in the Marae Gallery near the Maori House.

(Top Left) A mix of contemporary decorative baskets sitting inside a large, berry-picking basket. A small, tied bundle of tobacco—a sacred medicine that cleanses, comforts, and offers protection—accompanies the baskets.

(Above) Many of the baskets in the exhibition will share their stories with visitors. This basket, crafted in the 1960s, shares that it was sold in order to help its maker earn a living.

100

CELEBRATING 100 YEARS OF OUR LAKEFRONT HOME

The Field Museum was founded by Marshall Field I as part of the 1893 World's Fair.

Its first home, the Palace of Fine Arts, was designed to house exhibitions, but not to last for decades or accommodate a rapidly-expanding collection. An estate gift from Mr. Field made it possible for Museum Trustees and civic leaders to consider moving to a permanent home in Grant Park. They broke ground in 1915 and the new Field Museum building opened to the public in 1921.

Today, the Field Museum is home to a collection of 40 million objects and specimens and a community of more than 140 scientists whose work inspires visitors from around the world.

Our home is a Chicago landmark with a global footprint.

Join us as we celebrate throughout the year.

Look for opportunities to join our community of centennial donors, in commemoration of this milestone anniversary.

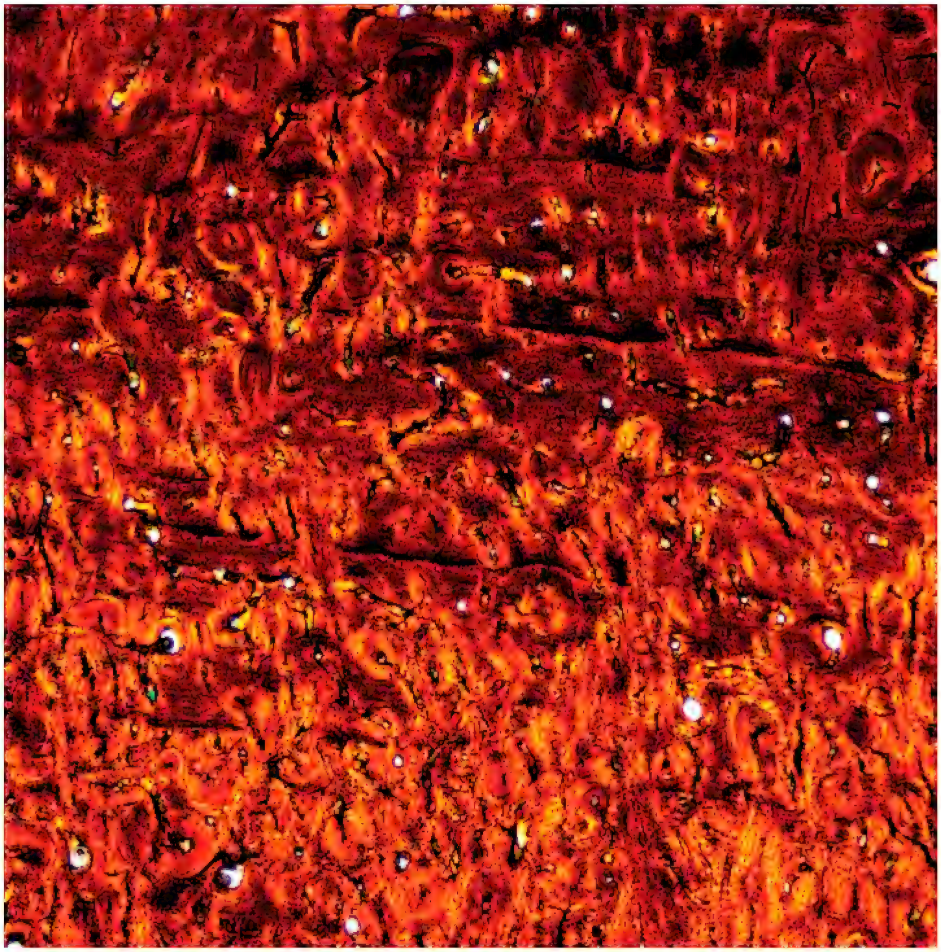
Send us stories and photos of your favorite visit to the Field.

Tell us what our home means to you and Chicago. Email your picture with a brief description to ITF@fieldmuseum.org. We would be proud to feature some of your recollections in upcoming issues.

(Left) Opening day visitors on May 2, 1921.

(Above, left) Elmer Riggs (left) and Robert C. Thorne with the pelvis of a Proboscideaull, *(extinct cousin of the African Elephant). Several fossils from this specimen were discovered by Riggs in 1927 on the Second Captain Marshall Field Paleontological Expedition.*

(Above, right) Curator of Paleomammalogy Ken Angielczyk searches for fossils.



(Left) A microscopic image of the slice of SUE's fibula showing growth rings.

(Below) Paleontologist Tom Cullen cutting into SUE the T. rex*'s thigh bone to learn how* T. rex *grew.*

TOM CULLEN

DAVID EVANS

HOW DID DINOSAURS GET SO BIG?

BY KATE GOLEMBIEWSKI, PUBLIC RELATIONS

At 42 feet long and around 16,000 pounds, SUE the *T. rex* was one of the biggest predators to ever walk the Earth. Scientists knew, in part from analyzing SUE's bones, that *T. rex* reached huge sizes due to growth spurts as adolescents. But it wasn't clear if all large predatory dinosaurs shared this growth pattern—some animals, like alligators, grow steadily throughout their lives. To figure out how different groups of dinosaurs grew, researchers sliced into fossils and analyzed the growth lines.

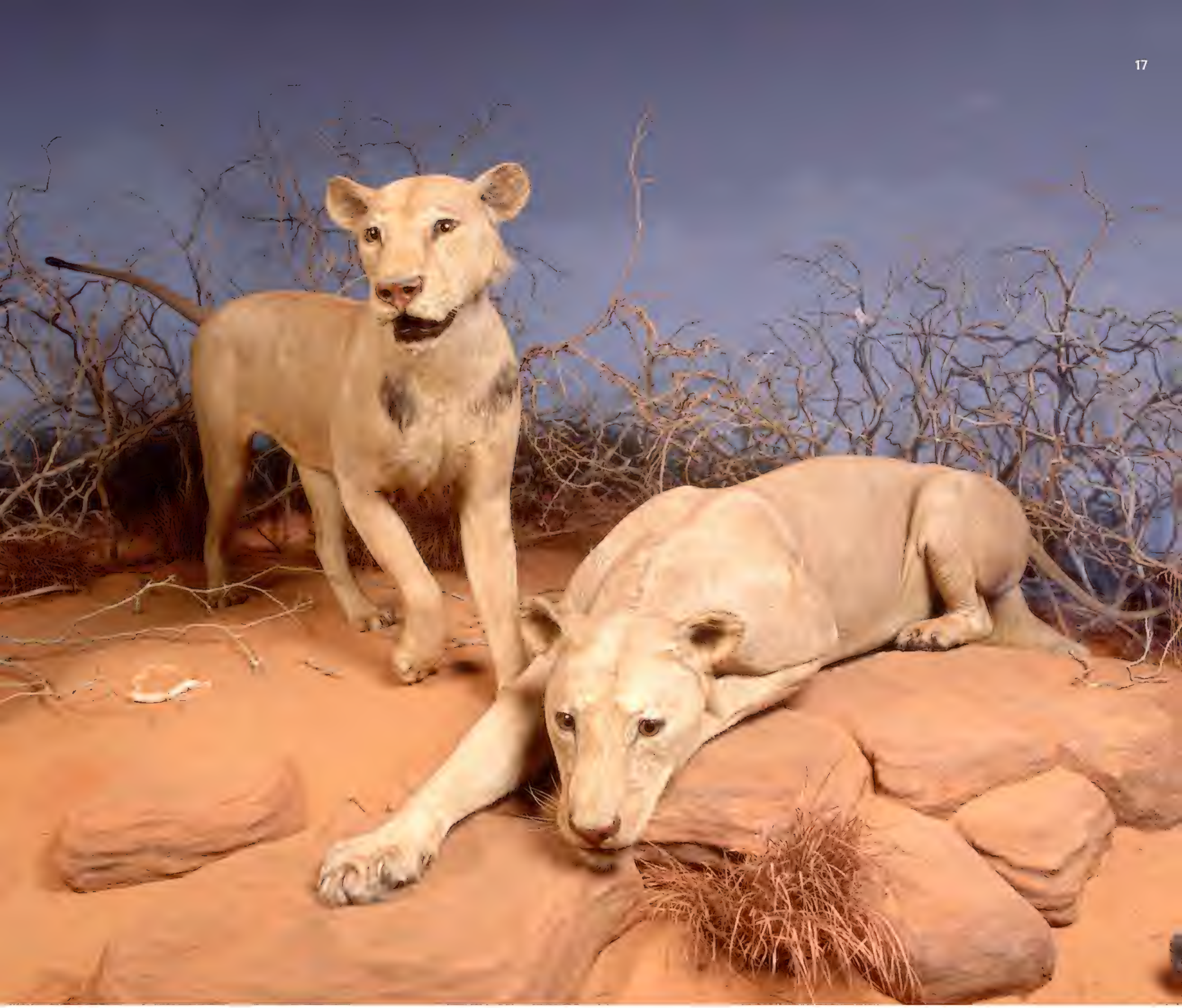
"Inside the bones as an animal grows, there are markings similar to tree rings that record roughly how old the animal is, how much it grows each year, and a number of other factors," said Thomas Cullen, PhD, a former postdoctoral researcher at the Field Museum. To find these growth rings, Cullen and his colleagues (including former Field Curator of Dinosaurs Pete Makovicky, PhD) sliced into fossils from dozens of two-legged predatory dinosaurs, from ones the size of dogs and ostriches all the way up to SUE. (Don't worry, the piece of bone they removed from SUE is about the size of a D-battery, and has been patched.)

They then examined thin slices of the fossils under a microscope, illuminating the structure of the blood vessels that passed through the bone. More organized canals mean slow growth, and more chaotic structures indicate periods when an animal experienced a growth spurt.

Cullen found that the dinosaurs' growth patterns depended on their family. *T. rex* and its closest relatives showed a period of extreme growth during adolescence (SUE probably gained 35-45 pounds a week as a teenager), and then slowed once they reached adulthood. Their more distant cousins could reach sizes almost as big as *T. rex*, but they grew slowly throughout their whole lives, with the oldest individuals reaching the biggest sizes.

"I'm really proud of this work," said Cullen. "It's the culmination of many, many years of small projects building towards a central goal of understanding growth in these animals and the many factors that influence these patterns."

> "Inside the bones as an animal grows, there are markings similar to tree rings that record roughly how old the animal is, how much it grows each year, and a number of other factors."



Meet the Most Infamous Members of Our Collection

Tucked within an arresting collection of taxidermied mammals of Africa in the Rice Gallery, the man-eating lions of Tsavo are two of the Field Museum's most famous residents.

In March 1898, the British started building a railway bridge over the Tsavo (SAH-vo) River in Kenya. But the project took a deadly turn when, over the next nine months, two maneless male lions mysteriously developed a taste for humans and went on a killing spree.

Starting Saturday, April 3rd, you can catch a new morning chat on the Tsavo Lions during Early Entry hours. Learn all about the reign of terror these man-eaters wrought in Kenya, how they came to the Museum and were preserved for display, and what we can continue to learn by studying them. Exclusive Early Entry hours are Saturdays, 8-9:30am.

ANCIENT SNAILS DISCOVERED LIVING ON UNDERWATER MOUNTAINTOPS

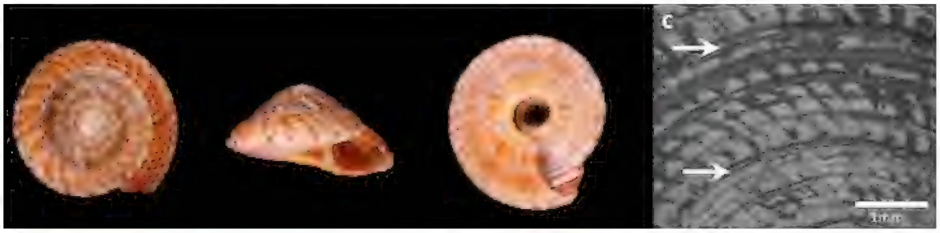
BY RÜDIGER BIELER, PHD, CURATOR OF INVERTEBRATES, NEGAUNEE INTEGRATIVE RESEARCH CENTER

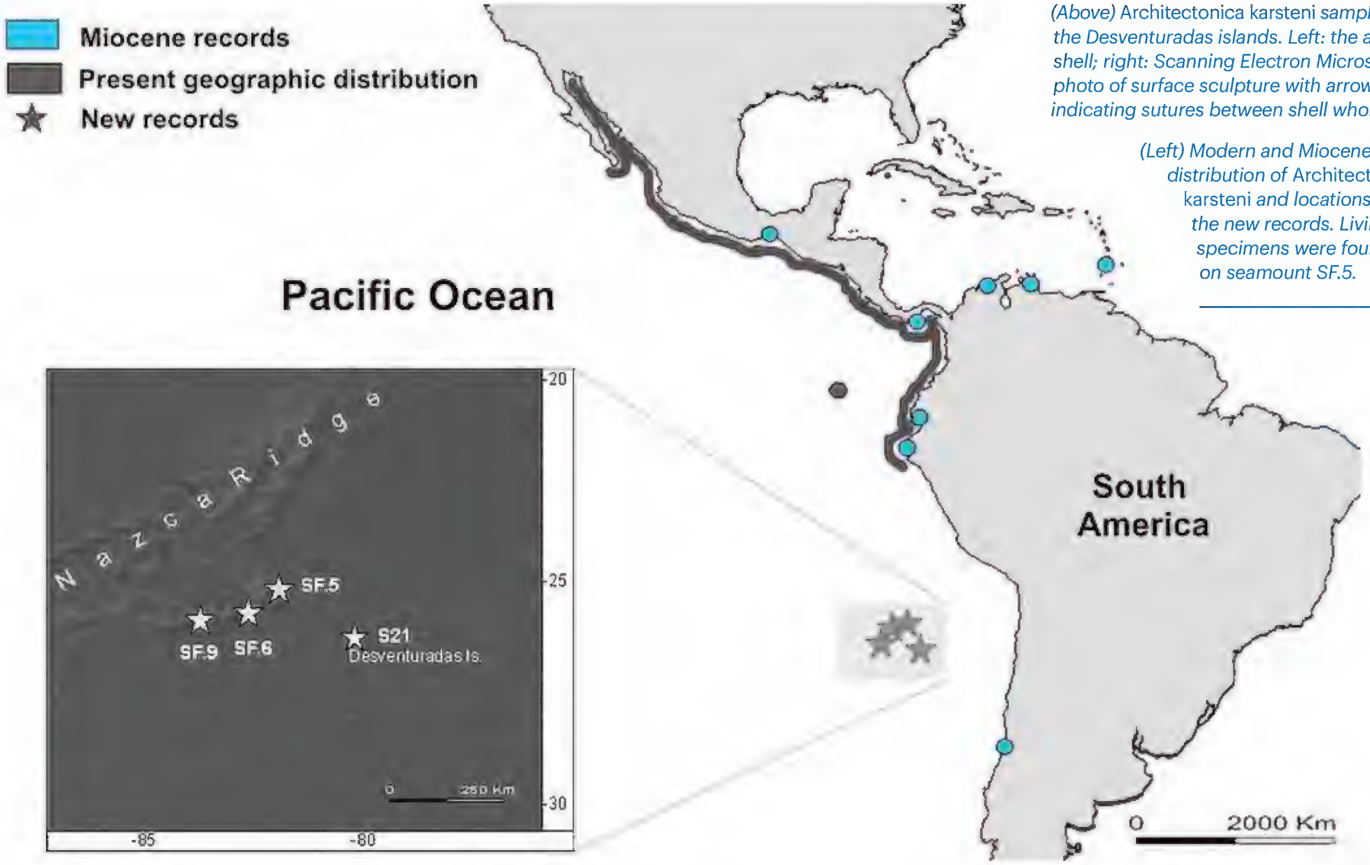
I have been studying marine gastropods (slugs and snails) and bivalves (oysters, clams, mussels, and scallops) for several decades, but I keep returning to one particular family because of their interesting biology: the Architectonicidae, or "sundial snails." All members of the group feed on coelenterates like sea anemones or hard coral and have an interesting larval biology that allows them to live for weeks or even months in the plankton of the world's oceans. They get around with ocean currents and, combined with their great fossil record, their mobility makes them excellent indicators for past and present ocean currents. They also provide interesting insights into how species with such dispersal abilities evolve. During recent fieldwork, my colleagues from Chile's Universidad Católica del Norte en Coquimbo made a remarkable discovery of living specimens of a species of sundial snail that hasn't existed off the Chilean coast for more than 5 million years.

This find, some 900 km west of Chile and about 200 meters deep on the underwater seamounts of the Nazca-Desventuradas Marine Park, poses interesting questions: Is this a massive range extension of the species, perhaps driven by changes in ocean currents, temperature, or changes in distribution of food organisms? Or could it be that the underwater mountains have served as a refugium—a location that supports an isolated population of a species—for an ancient relic population? Is there any genetic exchange with the previously known populations along the west coast of Central America and Mexico?

To address these questions, a molecular study is the next step in our research. This means conducting more regional fieldwork, as no preserved tissue samples from specimens of the northern populations are currently preserved in museum collections.

The world's oceans are still mostly uncharted territory. There are so many organisms we have yet to discover and understand. Surprise finds like this are what fuel science and lead to important questions about Earth's living diversity.





(Above) Architectonica karsteni *sampled in the Desventuradas islands. Left: the adult shell; right: Scanning Electron Microscope photo of surface sculpture with arrows indicating sutures between shell whorls.*

(Left) Modern and Miocene distribution of Architectonica karsteni *and locations of the new records. Living specimens were found on seamount SF.5.*

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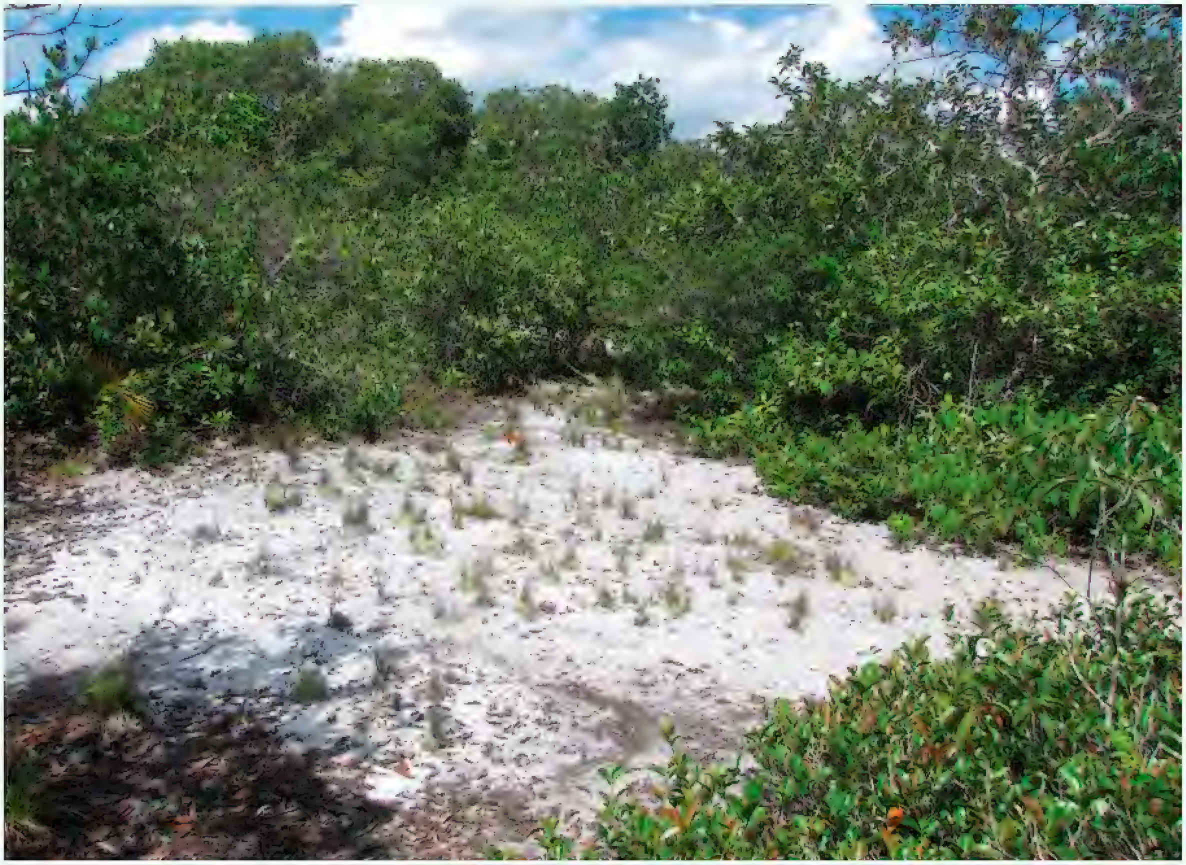
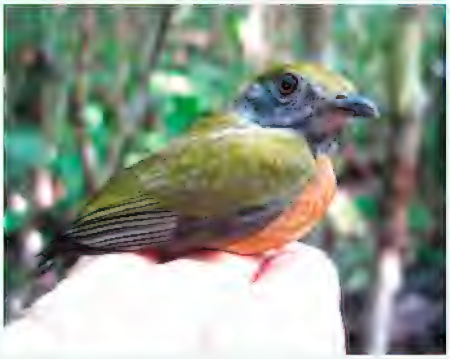


JOÃO CAPURUCHO

White sand ecosystem patch at the Reserva de Desenvolvimento Sustentável (RDS) do Uatumã, Central Amazonia.

"SAND FOREST" BIRDS PLAY BY DIFFERENT RULES

BY KATE GOLEMBIEWSKI, PUBLIC RELATIONS



JOÃO CAPURUCHO

Picture the Amazon. You're thinking lush rainforests teeming with animals, right? It turns out, the Amazon Basin contains other less-famous ecosystems that have been under-studied by biologists for years, including patches of habitat growing on white sands. Researchers from the Field discovered that, unlike birds in the dense rainforest, the birds living in these "sand forests" travel from one habitat patch to another and interbreed. It's a characteristic that could change the way conservationists protect sand forest birds.

"We wanted to know if the behavioral and evolutionary patterns for white sand birds were the same as birds living in dense rainforest, and we found they were different in surprising ways," says John Bates, PhD, Curator of Birds.

In the dense Amazon rainforest, many birds become genetically distinct from each other and branch off into different species if they're separated by a barrier like a river that's too wide to cross. But when Bates and postdoctoral researcher João Capurucho, PhD, analyzed DNA from the white sand birds, they found that they don't follow this evolutionary trend. Instead of only interacting with their close neighbors the way birds do in the dense rainforest, the white sand birds fly between patches of habitat, sometimes hundreds of miles apart, and interbreed with the birds there.

Now that scientists know more about white sand birds' ranges and genetic patterns, they can help conservationists figure out how to set aside and protect land in ways that benefit the animals living there.

"As the climate changes, these habitats will change too. So we need to understand how birds are distributed," says Capurucho. "We need to know whether they have a big range or if they're restricted to a small area, and what traits lead to these differences. If we understand that, we can manage threats to these birds and their habitats."

SURPRISING SECRETS OF LICHEN REPRODUCTION

BY KATE GOLEMBIEWSKI, PUBLIC RELATIONS

In northern Canada, the forest floor is carpeted with reindeer lichens. They look like a moss made of tiny gray branches, but they're stranger than that: they're composite organisms, a fungus and algae living together as one. They're a major part of reindeer diets, hence the name, and the forest depends on them to move nutrients through the ecosystem. They also, at least in parts of Quebec, are reproducing in a way scientists didn't expect. In a new study, researchers found that the reindeer lichens they examined have unexpected levels of genetic diversity, indicating that the lichens have been doing more gene-mixing with each other than the scientists would have guessed.

"We were surprised because this species of reindeer lichen had always been considered mainly a clonal species that reproduces asexually," said Marta Alonso-García, PhD, the paper's lead author and a postdoctoral fellow at Quebec's Université-Laval. "It doesn't follow the expected pattern."

When lichens reproduce sexually, they send out root-like structures toward a neighboring fungus and exchange genetic information when they touch. They then release spores—single cells containing genetic material—that travel on the wind and disperse. When they land, they start growing and produce a new, genetically distinct fungus. In asexual reproduction, a piece of the entire lichen, called the thallus, is pinched off and regrows into a new organism that's genetically identical to its parent.

"Sexual reproduction is very costly," said Felix Grewe, PhD, the co-director of the Field Museum's Grainger Bioinformatics Center and a co-author of the study. "You have to find your partner, it's more difficult than reproducing asexually. But many organisms do it because when you have this combining and mixing of genetic traits, it enables you to weed out negative mutations, among other benefits."

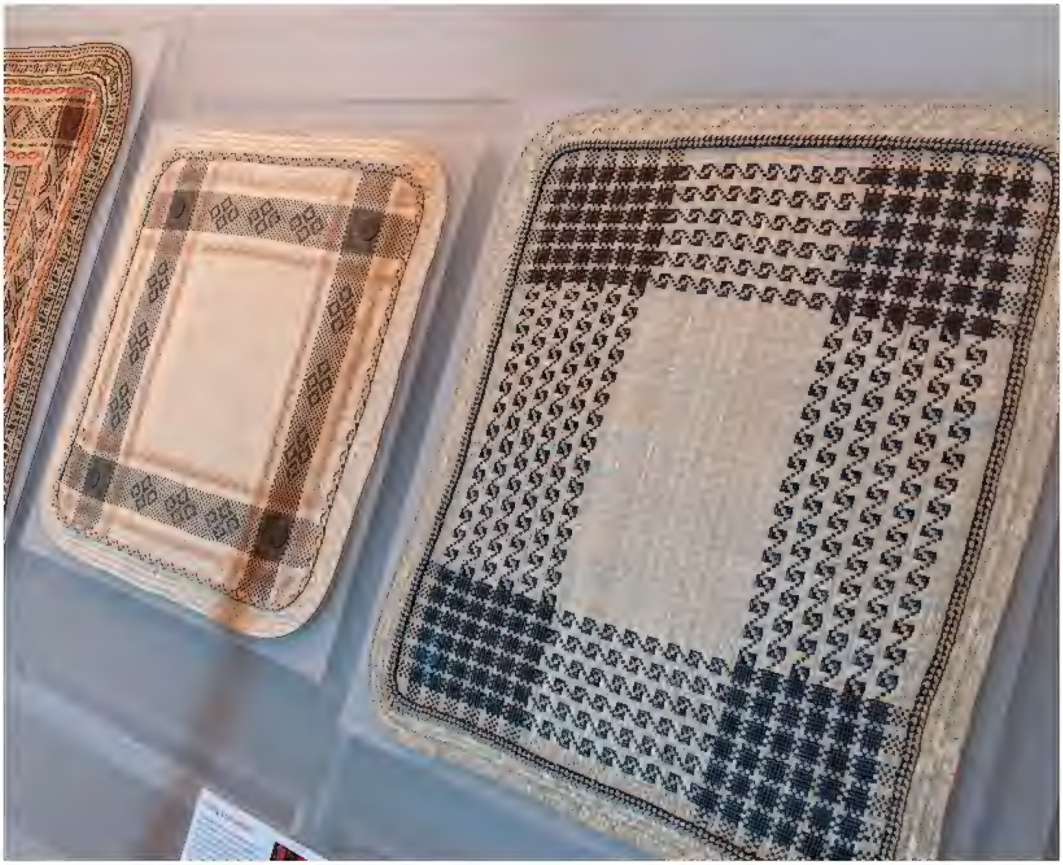
When the team studied the lichens' DNA in the museum's Pritzker Laboratory, they found more genetic variation in the lichens than expected, and that indicates sexual reproduction. "It's a general assumption was that these reindeer lichens mainly reproduce asexually because there's little evidence for them producing spores, but now the genetic data shows all this diversity, and that leads to the assumption that might be some form of sex," said Grewe.

The study could have implications for forest conservation, since scientists look to lichen growth to determine how ecosystems regrow after forest fires. "We have learned that time since the last fire does not necessarily mean more genetic diversity, so conservation strategies in boreal forests should take this into account," said Alonso-García.

(Below) A Canadian forest carpeted with reindeer lichen.

(Bottom) Reindeer lichen up close.

BOTH IMAGES MARTA ALONSO-GARCÍA



JOHN WEINSTEIN

These decorative woven mats called jaki-ed (JAH-ghee-ed) were among the items purchased by Regenstein Collections Manager Christopher Philipp on his trip to Majuro in 2019. The group that made these mats are creating jaki-ed together, and passing down this integral cultural artform.

HOME IS WHERE THE JAKI IS

BY MONISA AHMED AND RYAN SCHUESSLER, EXHIBITIONS

In 2019, a group of Marshallese students from Enid, Oklahoma visited the Field Museum to create an exhibition celebrating their heritage. The exhibition, which opened to the public on October 16, is part of a rotating gallery space in the *Regenstein Halls of the Pacific*.

The Republic of the Marshall Islands and Enid are separated by over 5,000 miles of land and sea. Yet, Enid is home to one of the largest Marshallese populations in the US—over 3,500 people. The students, as representatives of their community, were accompanied by Terry Mote, head of the Enid Micronesian Coalition and two of their teachers. Together they visited the Museum, toured the collections, and worked with Museum staff to envision their own exhibition.

RYAN SCHUESSLER

During their tour of the Museum's Marshallese collections, a remarkable thing happened. While combing through an album of photographs taken by Field Museum anthropologist Alexander Spoehr in 1947, Terry Mote paused at a photo of an unnamed little girl and said: "That's my mom." Museum staff were thrilled to present Mojina Jinuna Mote with a print of her photo on a trip to Enid a month later.

The exhibition features an array of historic and contemporary Marshallese items from the Field's collections, including canoe models, a traditional stick chart, and several examples of handicrafts, or *amimono*, selected by the students. It also includes items purchased by Regenstein Collections Manager Christopher Philipp during an outreach trip he and Exhibition Developer Ryan Schuessler took to Majuro in October 2019.

In addition to celebrating Marshallese culture across time and place, the exhibition explores the ongoing impacts of colonization, US nuclear bomb testing, and climate change on the Marshall Islands and its people. These are the very things causing Marshallese people to move to places like Enid.

One of the first things visitors will see in the gallery is a *jaki* (JAH-ghee)—a woven mat. Laid out on the floor and in the open, it was important to the students that the jaki be displayed like it would in any Marshallese household.

"The jaki is a hand-woven floor mat that can be found in nearly every Marshallese household. It is a place of rest, a symbol of identity, and a tool that connects us. As climate change devours our islands, many of us in the United States are losing a sense of our home and culture. Despite this, our families try hard to help us remember who we are. The jaki helps us do just that," said the student group.

Home is Where the Jaki is will be on display through March of 2022.

BRING SCIENCE HOME

BY LAUREN WAGNER, LEARNING CENTER

Join the Learning Center online for two special programs for young explorers! As social distancing continues in 2021, we won't let it stop us from sharing science and supporting the next generation.

(Below, left) Holly, a Field Museum Member, interacts with a 3D model of SUE during a Virtual SUE experience event.

(Below, right) On an episode of Discovery Adventures, Learning Center staff Marcy (top) and Anna discuss leaf molds used to create detailed dioramas.

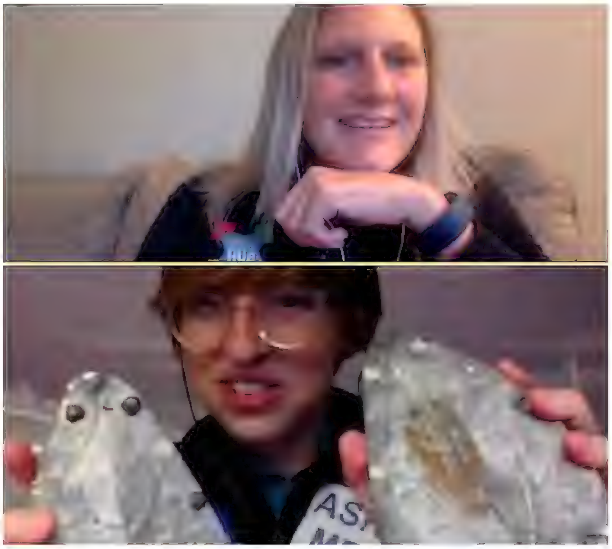
Virtual SUE Experience

For individuals of all ages, the *Virtual SUE Experience* provides a way for Field Museum enthusiasts to engage in a learning experience all about SUE from the comforts of their homes. In this program, individuals learn about SUE's life and death, and the fossil's original discovery, while answering interactive trivia questions along the way. *Virtual SUE Experience* also offers special occasion themed events, including Spooky SUE in October, Prehistoric Winter in December, and Cretaceous Cupid in February. For more information on upcoming SUE events and to register for a SUE tour visit fieldmuseum.org/our-events. For special request from teachers, senior living facilities, and other groups please email educators@fieldmuseum.org.

> "I have been studying the Cretaceous period at school, so this special program with the Field Museum was so useful! It was really inspirational to learn more about SUE The *T. Rex*, especially because I want to be a paleontologist when I grow up. It was also really cool and special to talk to people who work at my favorite museum!"

Holly, age 9, Field Museum Member

Discovery Adventures



KELLY OWEN

Discovery Adventures offers compelling virtual experiences that provide kids, families, and schools access to the Field's vast collections. This program is a live, interactive 30-minute virtual series inspired by the Discovery Squad carts typically stationed in Stanley Field Hall. With a new theme each week, Learning Center staff take viewers on a journey throughout the museum. Each session is streamed live on the Field Museum YouTube channel, with no registration required. For more information on weekly themes and upcoming events, visit fieldmuseum.org/our-events.

> "My class learned so much, but best of all they really felt like they were on a field trip. These virtual field programs make a big difference in our lives and the education of our youth. Even though your doors have been closed, you have opened new windows into the hearts and minds of our youth and people young and old all around the world."

Suzanne J. Smith, Columbia Central Middle School, Steger, IL, and Field Museum Member

SHOP SUSTAINABLY AT THE FIELD MUSEUM

BY EMILIE KRISTEK, RETAIL

Field Museum Stores are passionate about sustainability, reducing our waste, and recycling as much as possible. We're always looking for fun and creative ways to be more environmentally conscious, from partnering with eco-friendly vendors to reusing shipping materials.

Our most recent sustainability effort introduced the Eco-Pals line from Wildlife Artists to our stores. Featuring super-soft fabrics and sewn eyes (instead of plastic buttons), this is the kind of plush toy we want to cuddle all day long. While most plush toys labeled as eco-friendly only have recycled fill, this line is 100% recycled inside and out and contains no new plastic pieces. The plush ships from our vendor wrapped in kraft paper, tied with string, and labeled with uncoated paper tags. Our personal favorite? While we are partial to the *T.rex*, the stegosaurus is pretty cute.

Our online store is also taking great strides to reuse as much packaging as possible. Traditional retail stores will not reuse packaging, and any consumer-facing packaging is custom branded to the store. As beautiful as custom packaging is, it doesn't make our planet pretty. By reusing the packaging already provided by our vendors, we've reduced our carbon footprint drastically. Even with the continued growth we've experienced in our online retail store, we're sticking to our eco-friendly roots by ordering plain recycled kraft boxes and kraft paper, which are reusable and curbside recyclable. Occasionally, when we are out of kraft paper, we'll use second-hand bubble wrap or packing foam sheets. Your mug just might arrive in the same packing foam used to protect an item featured in the latest traveling exhibition.

While we all have a long way to go to reduce our carbon footprint, we're excited about how far the Field Museum stores have come. We're dedicated to creating a brighter (and greener!) future for ourselves and our visitors!

Find your perfect natural history gifts, toys, apparel, and more at store.fieldmuseum.org.

Shop online today! Members receive a 10% discount at Field Museum stores.

(Above) Reused shipping boxes with recycled Field Museum logo sticker.

(Left) Eco Pal Dinosaur plush toys from Wildlife Artists. These cute plush are 100% recycled and have no new plastic pieces.

Be a Scientist this Spring!

By Erika Hasle
CONSERVATION ECOLOGIST,
KELLER SCIENCE ACTION CENTER

Lex Winter
SENIOR SCIENCE COMMUNICATION
SPECIALIST, KELLER SCIENCE
ACTION CENTERR

For the last five years, the Field's Keller Science Action Center has been working to reverse the monarch butterfly's rapid decline. Our conservation scientists want to know how migrating monarchs fare when they stop in cities and suburbs—and they need your help.

ERIKA HASLE

A monarch rests on a Common Milkweed bloom planted by a local Edgewater resident.

URSULA ALVARADO MILLER

In December 2020, the United States Fish and Wildlife Service announced that the monarch butterfly—once common across the continental United States—meets the criteria for an endangered species. Its official "endangered" listing has been delayed in favor of higher priority species, but our team and other monarch researchers across the nation will continue monitoring monarchs with the same urgency as before.

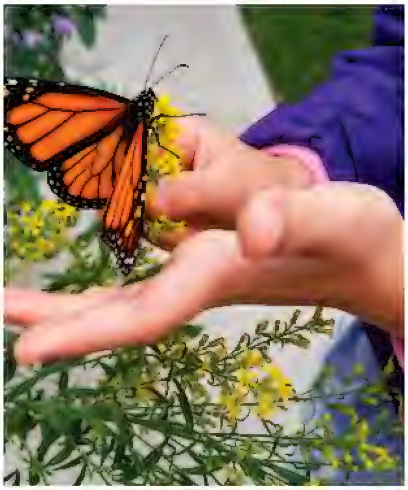
The Upper Midwest provides habitat that's absolutely critical to monarch butterflies, whose population has declined over 80 percent in the last 20 years. One cause of that decline is loss of their host plant, milkweed (*Asclepias* sp.). Adult monarchs will only lay eggs on milkweed plants, which is also the only plant monarch caterpillars will eat.

To recover monarch populations, we must add milkweed to the landscape include city gardens gardens large and small. This will only be possible with the help of community-scientists throughout the region.

The Field Museum's monarch program focuses on urban and suburban neighborhoods, asking community scientists to monitor monarch caterpillars on milkweed in their gardens (or on their porches and balconies) throughout the Chicagoland area and share their observations with our team in weekly online reports.

Many community scientists appreciate the way monarch monitoring turns their focus to the small things in their yard. "I observed a monarch laying eggs on some of the new milkweed shoots coming up in the garden. These tiny shoots are teaming with life. Hard to believe that so many creatures live on one small plant," community scientist Judith Rice wrote.

The Keller Center team is actively recruiting Monarch Community Science volunteers for the summer of 2021. All you need to participate is a device with an internet connection and at least one milkweed plant growing in the ground or in an outdoor pot. There is a milkweed species appropriate for almost any setting, from common milkweed (*Asclepias syriaca*) that is easy to establish but somewhat aggressive, to more cooperative species that will stay put and add texture, color, and fragrance to your space. These include swamp milkweed (*Asclepias incarnata*), best suited to wet conditions, and butterfly milkweed (*Asclepias tuberosa*), a good choice for drier soil. Choosing the plant best suited for both the soil conditions and sun exposure in your yard will set you up for success. Non-native tropical milkweed (*Asclepias currasavica*), often available in big-box stores, should be avoided in favor of species native to your region.



ERIKA HASLE

For information on the project and to sign up for training webinars in May and June, please visit: bit.ly/monarchmonitors. Our team is excited to offer this project in both Spanish and English.

The Upper Midwest provides habitat that's absolutely critical to monarch butterflies, whose population has declined over 80% in the last 20 years.

(Above, left) A monarch caterpillar crawls on a leaf in the Rice Native Gardens at the Museum.

(Above, right) A monarch butterfly rests on a goldenrod in Jefferson Park, Chicago.

Member Opportunities

JAMES Q MARTIN

2021 VIRTUAL WOMEN IN SCIENCE KEYNOTE AND CONSERVATION CELEBRATION

Thursday, May 6, 2021, 12:30pm CST

Celebrate and support the next generation of female scientists with the 2021 Women in Science virtual keynote and Conservation Celebration. These events are sponsored by the Field's Women's Board. Connect with educators, students, STEM scholars, and museum leaders in a variety of online and in-person events. Women in Science proceeds support internship and fellowship opportunities for women pursuing careers and research in the sciences.

The events kick off with a virtual keynote featuring Kristine Tompkins, co-founder and president of Tompkins Conservation and the UN Patron of Protected Areas (pictured right). A live audience Q&A follows.

The virtual keynote will stream online from 12:30–1:30pm CST on May 6. For more information about sponsorships, tickets, and to register online, please visit www.fieldmuseum.org/WISLunch.

EXCLUSIVE EARLY ENTRY FOR MEMBERS AND DONORS

Saturdays through April 24, 8–9:30am

Now through April 24, members and donors can enjoy exclusive early entry on Saturdays. Starting Saturday, April 3rd, you can catch a new morning chat on the Tsavo Lions during Early Entry Hours. Learn all about the reign of terror these man-eaters wrought in Kenya, how they came to the Museum and were preserved for display, and what we can continue to learn by studying them. **Cut out the next page and take a special tour of the taxidermy halls you know well with a new perspective: tracking down works from the Museum's first African American taxidermist, Carl Cotton.**

UPCOMING VIRTUAL EVENTS FOR MEMBERS AND DONORS

Conservation Ecology and Amphibians
Wednesday, April 28, 6:30–7:30pm CST

Learn about the Keller Science Action Center's Rapid Inventories and Michelle's work studying neotropical amphibian and reptile diversity.

Michelle Thompson, PhD, Conservation Ecologist/Herpetologist, Keller Science Action Center

70th Annual Members' Nights Kick-off
Wednesday, May 19, 6:30–7:30pm CST

Kick-off the 70th Annual Members' Nights and celebrate the 100th anniversary of the Field Museum's current home while peeking behind the scenes and learning about objects that aren't normally on display.

Becoming Jane: A Journey through Conservation
Wednesday, June 16, 6:30–7:30pm CST

Explore the work of Dr. Jane Goodall and learn how you can get involved with conservation in Chicagoland.

Erika Hasle, Conservation Ecologist, Keller Science Action Center

All member events will be held virtually via Zoom. Occasionally, we may need to change the dates of our programs. Please watch your email for invitations with confirmed dates and times, closer to the event.

CARL COTTON
Riddle-me Activity

Use the map attached to this activity sheet to answer the following 5 riddles related to Carl Cotton's taxidermy displays. **The answer to each riddle will be a number.** Then, apply the noted math equation to each answer in sequence to unlock the activity's final answer: a significant number for the Field Museum in 2021. **Tip:** a calculator and stopwatch (or phone) might help you out!

a.	**Any Carl Cotton Display**	My name's Carl Cotton, as I'm sure you've now heard. I made lots of displays, stuffed with lizards and birds. As a Black taxidermist I was first at the Field, And in 25 years I produced quite the yield!	Attached to my work you'll find decals with my face. **The year of my birth will start you in the right place.**
b.	**Marsh Birds of the Upper Nile**	It's a picturesque scene, here at Kyoga Lake, In the bottom right corner you'll find me, the Black Crake. I'm not big and tall like the stork or the crane, But the sketch on the side shows me in the same vein.	Each species is labeled and clearly defined. **Transcribe the number to which I'm assigned.**
c.	**Crocodilians**	In the back of the hall, past the big Grecian columns, You'll find me and two friends in a case looking solemn. That's not me on the box or with the snout that is strange, I'm the one of the three with the most limited range.	Discovered, forgotten, then once again seen: **Calculate the number of years in between.**
d.	**Colorful Birds**	I once perched atop Cotton's great avian tower, And I bloomed there for years like a red, rosy flower. Though the piece was dismantled, I just can't let it go. You can still see the metal I hold onto in toe.	If you haven't guessed yet, I'm the one that's Macaw-ing **Find the number below me, attached to my drawing.**
e.	**Willow Ptarmigan**	Cinderella, that's a tale about me. I'm the plain, brown Willow Ptarmigan you see. But when the snow falls, dancing merry and bright, My dishwater plumage turns a wintery white.	This display shows both looks, white and brown: **Count the seconds I spend in either gown.**

Start With

○

÷ ○ = ______

- ○ = ______

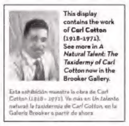
+ ○ = ______

+ ○ = ▭

(**hint:** a birthday this building is excited to cheer,
These halls have been open for this number of years).

CARL COTTON DISPLAY MAP

Look for (right) in these spots around the museum to find Carl Cotton's other work. How many displays can you find?


This display contains the work of Carl Cotton (1918–1971). See more in *A Natural Talent: The Taxidermy of Carl Cotton* now in the Brooker Gallery.

Esta exhibición muestra la obra de Carl Cotton (1918 - 1971). Ve más en *Un talento natural: la taxidermia de Carl Cotton*, en la Galería Brooker a partir de ahora

MAIN LEVEL

1, 2, 3 Perching birds from around the world | *Gidwitz Hall of Birds*
4 Cranes and other long-legged birds | *Gidwitz Hall of Birds*
5 Woodpeckers and Kingfishers | *Gidwitz Hall of Birds*
6 Owls, Hummingbirds, and Mousebirds | *Gidwitz Hall of Birds*
7 Parrots and Pigeons | *Gidwitz Hall of Birds*
8 Shorebirds | *Gidwitz Hall of Birds*
9 Marsh Birds of the Upper Nile diorama | Bird Habitats
10 Willow Ptarmigan with optical illusion | Bird Habitats
11 Crocodilians made by Cotton and Walters | Reptiles & Amphibians
12 Colorful birds from Cotton's sculptural display | *What is an Animal?*
13 Sockeye Salmon turned red for mating season | *What is an Animal?*
14 Alligator Snapping Turtle luring a fish | *What is an Animal?*

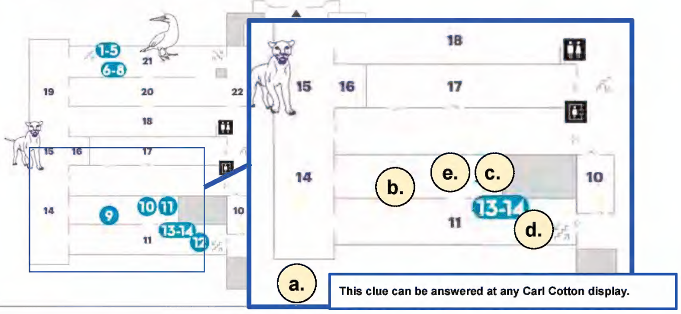
MAPA DE LA EXHIBICIÓN CARL COTTON

Busca (la izquierda) en estos lugares alrededor del museo para encontrar más trabajos de Carl Cotton. ¿Cuántos puedes encontrar?

NIVEL PRINCIPAL

1, 2, 3 Aves paseriformes del mundo | *Sala de Aves Gidwitz*
4 Grullas y otras aves de patas largas | *Sala de Aves Gidwitz*
5 Carpinteros y alcedínidos | *Sala de Aves Gidwitz*
6 Búhos, colibríes y pájaros ratón | *Sala de Aves Gidwitz*
7 Loros y palomas | *Sala de Aves Gidwitz*
8 Aves costeras | *Sala de Aves Gidwitz*
9 Diorama de aves de pantano del Nilo Superior | Hábitats de Aves
10 Lagópodo común con ilusión óptica | Hábitats de Aves
11 Cocodrílidos creados por Cotton y Walters | Reptiles y Anfibios
12 Aves coloridas de la muestra escultural de Cotton | *¿Qué es un Animal?*
13 Salmón rojo tornado rojizo para la temporada de apareamiento | *¿Qué es un Animal?*
14 Tortuga caimán atrayendo un pez | *¿Qué es un Animal?*

M
Main Level

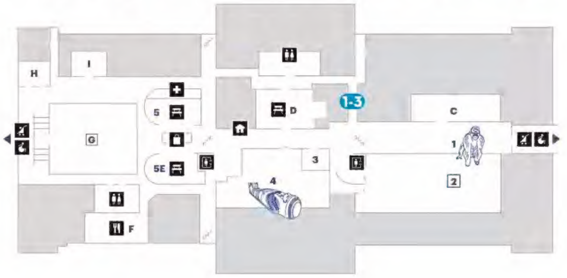


This clue can be answered at any Carl Cotton display.

GROUND LEVEL
1, 2, 3 The Insect World | Hallway near Siragusa Center

PLANTA BAJA
1, 2, 3 El Mundo de los insectos | Pasillo cerca del Centro Siragusa

G
Ground Level



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The Field Museum is open Thursday through Monday from 9am to 5pm, with last admission at 4pm. The Museum will be closed on Tuesdays and Wednesdays until further notice. **For the most up to date information, parking, and public transportation options, visit fieldmuseum.org/visit.**

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